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Patent and Trademark Office

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/915,658 09/21/97 TRIVEDI

J MID024PA

EXAMINER

MM42/0909

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PERALTA, G

ART UNIT

PAPER NUMBER

2814

DATE MAILED:

09/09/99

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

# Office Action Summary

Application No.

08/915,658

Applicant(s)

TRIVEDI, JIGISH D

Examiner

Ginette Peralta

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☐ Claim(s) 31-40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 31-40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some \* c) ☐ None of the CERTIFIED copies of the priority documents have been:
1. ☐ received.
2. ☐ received in Application No. (Series Code / Serial Number) \_\_\_\_.
3. ☐ received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

## Attachment(s)

- 14) ☒ Notice of References Cited (PTO-892)
- 15) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 16) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_
- 17) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_
- 18) ☐ Notice of Informal Patent Application (PTO-152)
- 19) ☐ Other: \_\_\_\_\_

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## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 31, 32, 33, 34, 35, 36 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chung (U.S. Pat. 5,646,070).

Chung teaches a method for forming a local interconnect that comprises a field effect transistor having a source, a drain and a gate, a composite structure with a first refractory metal silicide 32 and a second refractory metal silicide 40 wherein the first refractory metal is titanium and the second refractory metal is tungsten, and the thickness of the composite structure is between 200Å and 2000Å.

Chung also teaches that at temperatures above 900°C an intermetallic compound comprising tungsten and titanium is formed between the first and second silicide layers.

It would have been obvious to one of ordinary skill in the art to form a composite structure such as the one taught by Chung and to include the intermetallic compound to promote better adhesion between the silicide layers that the composite structure comprises.

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3. Claims 38, 39 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dao et al. in view of Chung.

Dao et al. teaches in his article a memory array architecture that consists of cells stepped repetitively in both x and y dimensions to form a two dimensional array (i.e. rows and columns), and connecting the gates and moats by using titanium silicide local interconnects.

Chung teaches a method for forming a local interconnect that comprises a field effect transistor having a source, a drain and a gate, a local interconnect for connecting at least one of a source, a drain and a gate of the field effect transistor to another active area, the local interconnect comprising a composite structure with a first refractory metal silicide 32 and a second refractory metal silicide 40 wherein the first refractory metal is titanium and the second refractory metal is tungsten.

It would have been obvious to one of ordinary skill in the art to form a local interconnect as taught by Chung in the memory array of Dao et al. because it provides a lower contact resistance.

Furthermore, it would have been obvious to one of ordinary skill in the art to form a composite structure such as the one taught by Chung and to include the intermetallic compound in order to promote better adhesion between the silicide layers that the composite structure comprises.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ginette Peralta whose telephone number is (703)305-7722. The examiner can normally be reached on Monday to Friday 8:00 AM-4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on (703)306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-7722 for regular communications and (703)308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

GP  
September 8, 1999

